

Application No. 10/588363  
Response to the Office Action dated February 1, 2010

### REMARKS

Favorable reconsideration of this application is requested in view of the following remarks.

The abstract has been amended to be one paragraph and further amended editorially.

Claim 1 has been amended to include the limitations of previously presented claim 4. Accordingly, claim 4 has been canceled without prejudice, and claim 5 has been amended editorially. Claim 19 has been amended editorially. Since claim 1 has been revised to include the feature of a previous dependent claim, no new issues are raised by the Amendment.

Claims 1-14, 19, and 21-23 have been rejected under 35 U.S.C. 102(b) as being anticipated by Kanamori et al. (International Patent Application Publication No. 02/085985) (the English equivalent U.S. Patent No. 7,297,743 is cited in the rejection. Hereinafter the referred portions of Kanamori are those of the English equivalent). Applicants respectfully traverse this rejection.

Claim 1 recites that a structure includes a transparent material, a cured product provided on the transparent material and formed from a curable composition, and a layer having photocatalytic activity-based antistaining properties provided on a surface of the transparent material. Kanamori discloses an example of a curable composition including titanium dioxide (TiO<sub>2</sub>) R 820, which is a product of Ishihara Sangyo (see example 4 in coln. 26 at lines 53-54). R 820 is a rutile type TiO<sub>2</sub> used for paints, plastics coatings, and painting ink as a white pigment (see an online catalogue of Ishihara Sangyo available at: [http://www.iskweb.co.jp/eng/products/p\\_popup01.html#01](http://www.iskweb.co.jp/eng/products/p_popup01.html#01), attached hereto). It is known in the art that TiO<sub>2</sub> may have three different crystal structures such as the rutile type, anatase type, and brookite type, that among these types, the anatase type TiO<sub>2</sub> has a photocatalytic activity, and that the rutile type TiO<sub>2</sub> does not have such activity (see also page 86, lines 21-33 of the specification). Thus, example 4 of Kanamori does not include

Application No. 10/588363  
Response to the Office Action dated February 1, 2010

the photocatalyst. When the photocatalyst such as the anatase type  $\text{TiO}_2$  is contained in the layer provided on the transparent material and is activated with sunlight, a surface of the structure including the activated photocatalyst can decompose organic substances, and the surface, which becomes superhydrophilic by the activation of the photocatalyst with sunlight, can be washed of organic and inorganic contaminants and pollutants easily. Thus the layer provided on the transparent material has the antistaining properties as claim 1 recites (see *id.*). Kanamori neither discloses a layer including the photocatalyst nor a layer having photocatalytic activity-based antistaining properties provided on a surface of the transparent material, and the reference fails to disclose one of the elements of claim 1. Accordingly, claim 1 and claims 2-3, 5-14, 19, and 21-23, which ultimately depend from claim 1, are distinguished from Kanamori, and this rejection should be withdrawn. Claim 4 has been canceled without prejudice.

Claims 15-18 and 20 have been rejected under 35 U.S.C. 102(b) as being anticipated by Kanamori et al. (International Patent Application Publication No. 02/085985) as evidenced by Fujita et al. (Japanese Patent Application Publication No. 2000-178456) (the English equivalents U.S. Patent No. 7,297,743 to Kanamori and U.S. 7,081,494 to Fujita are cited in the rejection). Applicants respectfully traverse this rejection.

Claims 15-18 and 20, which ultimately depend from claim 1, are distinguished from Kanamori for at least the same reasons as discussed for claim 1 above.

Fujita fails to disclose a layer having photocatalytic activity-based antistaining properties recited in claim 1 and does not remedy the deficiencies of Kanamori. Accordingly, this rejection should be withdrawn.

Application No. 10/588363  
Response to the Office Action dated February 1, 2010

In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance.



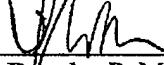
Dated: May 3, 2010

DPM/my/jls

Respectfully submitted,

HAMRE, SCHUMANN, MUELLER &  
LARSON, P.C.  
P.O. Box 2902  
Minneapolis, MN 55402-0902  
(612) 455-3800

By: \_\_\_\_\_

  
Douglas P. Mueller  
Reg. No. 30,300

## Product Recommendations

### ► Titanium dioxide in sulfate process (Rutile Type)

Grade	TiO <sub>2</sub> %	Main modifier	Average particle size (μm)	Oil absorption	Remarks
R-820	93	Al, Si, Zn*	0.26	24	R-820 shows good durability due to its crystal stabilization with zinc, and paint film properties. With these characteristics, this grade can be used for various applications such as paints, plastics-coatings (exterior PVC) and printing inks.
R-830	93	Al, Si, Zn*	0.25	21	R-830 shows good durability due to its crystal stabilization with zinc, and superior hiding power, tinting strength and gloss. With these characteristics, this grade can be used for various applications such as exterior/interior paints and printing inks. With the durability, this grade is suitable for PVC-coatings.
R-930	93	Al, Zn*	0.25	19	R-930 shows good durability due to its crystal stabilization with zinc, and its particle size distribution was narrowed to provide high gloss, superior hiding power and tinting strength. Therefore, this grade is suitable especially for gloss emulsion paints. This can be also used for durable industrial finishes.
R-980	93	Al, Organic	0.24	19	R-980 is suitable for various applications such as exterior paints and rigid PVC-coatings, where high durability is required. This grade can be also used for interior applications and various plastics such as Polypropylene and ABS.
R-550	94	Al, Si	0.24	23	R-550 is suitable for various applications such as water-based/solvent-based paints, printing inks and plastics.
R-630	94	Al	0.24	19	R-630 is suitable for water-based/solvent-based interior paints, gloss emulsion paints and surface printing inks where the high hiding power is required.
R-680	95	Al	0.21	19	R-680 is suitable for various applications such as water-based/solvent-based paints, printing inks and plastics. However, tarnish might happen when used for Pb-stabilized rigid polyvinyl chloride applications (for building materials).
R-670	93	Al	0.21	22	R-670 has high gloss and bluish color tone. Therefore, this grade is suitable especially for surface-printing inks where high gloss is required.
R-580	94	Al	0.28	19	R-580 shows excellent opacity under high pigment content. With this characteristic, this grade is suitable especially for thinly-applying inks such as metal coatings and whiteout.
R-780	88	Al, Si	0.24	33	R-780 has excellent hiding power and color strength especially under medium to high pigment content formulations in flat emulsion paint or gravure ink.

## ISK |Titanium dioxide in sulfate process (Rutile Type)

Page 2 of 2

R-780-2	80	Al,Si	0.24	40	R-780-2 is suitable especially for flat emulsion paint where high opacity is required with high pigment content.
R-850	90	Al,Si	0.24	-	R-850 is produced by unique technique, persuing its high light-stability and durability. In this sense, this grade is suitable when the high light stability is required, such as lamination paper.
R-855	90	Al,Si	0.26	-	R-855 serves good durability and high optical properties in lamination papers due to its ease of dispersion. In this regard, this grade is suitable when anti-greying is required, such as decorative papers and wall papers.
PF-736	94	Al,Organic	0.24	15	PF-736 serves high gloss and ease of dispersion. Therefore, this grade is suitable when the high gloss is required such as surface printing inks.
PF-737	95	Al,Organic	0.21	16	PF-737 offers superior color strength, peculiar bluish tone, and ease of dispersion. In this way, it's suitable for various plastics applications such as polyolefin, PVC and ABS.
PF-742	92	Al,Si,Zn*, Organic	0.25	21	PF-742 is specialized for laminate type gravure ink, serving good printing properties and opacity. This grade exhibits high opacity especially after lamination, and also shows good adhesivity and re-resolvability.

\*Reagents used for calcination.

(Note) The average particle size listed were measured using an electron microscope.